CONFERENCE ON DISARMAMENT

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PROGRESS REPORT TO THE CONFERENCE ON DISARMAMENT ON THE THIRTY-FOURTH SESSION OF THE AD HOC GROUP OF SCIENTIFIC EXPERTS TO CONSIDER INTERNATIONAL COOPERATIVE MEASURES TO DETECT AND IDENTIFY SEISMIC EVENTS

1. The Ad Hoc Group of Scientific Experts to Consider International Cooperative Measures to Detect and Identify Seismic Events, initially established in pursuance of the decision taken by the Conference of the Committee on Disarmament on 22 July 1976, held its thirty-fourth formal session from 27 July to 7 August 1992, in the Palais des Nations, Geneva, under the Chairmanship of Dr. Ola Dahlman of Sweden. This was the twenty-sixth session of the Group, convened under its new mandate by the decision of the Committee on Disarmament at its 48th meeting on 7 August 1979.

2. The Ad Hoc Group is open to all member States of the Conference on Disarmament. It is also open on a standing basis to all non-member States which have been invited upon their request by the Conference on Disarmament to participate in its work. Accordingly, scientific experts and representatives of the following member States of the Conference on Disarmament participated in the session: Australia, Canada, China, Czech and Slovak Federal Republic, Egypt, France, Germany, Hungary, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Netherlands, Pakistan, Peru, Romania, Russian Federation, Sweden, United Kingdom of Great Britain and Northern Ireland and the United States of America.

3. Scientific experts and representatives from the following non-member States of the Conference on Disarmament participated in the session: Austria, Finland, New Zealand, Norway, Spain and Switzerland.

4. During the session, 38 papers containing information on national investigations related to the work of the Group were presented by experts from: Australia, Austria, Czech and Slovak Federal Republic, Finland, Germany, Hungary, Indonesia, Italy, Japan, New Zealand, Norway, Peru, Romania, Russian Federation, Sweden, United Kingdom of Great Britain and Northern Ireland and United States of America.

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5. During its previous session, the Ad Hoc Group completed a technical evaluation of its Second Technical Test (GSETT-2). The results are contained in its sixth main report, submitted to the Conference on Disarmament as document CD/1144. During the present session, the Group completed five appendices to the sixth report, containing detailed technical material.

6. The Group continued its discussions on the seismological evaluation of the GSETT-2 and reviewed national investigations relevant in this regard. Subsequently the Group discussed a draft outline of the evaluation report and agreed on focusing this report on the detection and location capabilities achieved during GSETT-2. The Group envisages a report on this evaluation during its next session.

7. The Ad Hoc Group conducted in-depth discussions on the reassessment of the concept of a global system for the exchange of seismic data worked out in its Fifth Report (CD/903), based on the results and experiences gained from GSETT-2 and on recent scientific and technological developments. The discussions were focused on the overall design of the system and provided a basis for the direction of the Group's future work.

8. The Group noted that many of the results and experiences obtained in GSETT-2 will be important in reassessing the system concept and its various components. Some of the conclusions the Group drew from GSETT-2 will have a significant influence on the overall design of the system, e.g.:

- the need to take into account information from local and regional seismic networks;

- the future use of only one IDC (International Data Centre) in the global system;

- the need for improved analysis procedures, with emphasis on automation especially for event definition, location and depth estimation;

- the need for a network with adequate global coverage of high-quality stations, especially arrays.

9. The Group noted that many countries had undertaken bilateral cooperation in upgrading data acquisition, communication and data exchange systems during the GSETT-2. The Group encourages this cooperation to continue as it would contribute significantly to the future improvement of the system.

10. Over the last decade, scientific and technological developments have been significant not only in seismology, but also in information technology, an area of great importance for global seismological monitoring systems. The Group firmly believes that the design of the global system should fully utilize recent developments in science and technology. The Group identified the following areas as being important for the overall system concept:

- the rapid developments in global telecommunications;

- the general availability of high performance computers and methods and procedures for data management and analysis;

- the developments in regional seismology, i.e., based on seismological observations at distances less than 2,000 km.;

- the issues of redundancy, data authenticity, reliability and security.

The Ad Hoc Group envisages continuing the discussion of its future work, including the incorporation of new technologies, at its next session.

11. As to the overall conceptual design, the Group agreed on a tentative framework for studying design options, thus providing guidance to the more detailed work on the individual components of the system. This overall design concept might be revised in the light of results obtained from analysis of individual components.

This overall framework includes, inter alia:

- There should be only one IDC, which would operate on the basis of:

  (i) providing high quality data for national verification needs;

  (ii) increased automation in the analysis and operational procedures;

  (iii) improved quality control in all aspects of the system;

  (iv) improved procedures for waveform analysis;

  (v) the possibility of accepting and processing continuous digital data, provided that the seismological value of this can be demonstrated.

- The system would be composed of a global network of arrays and single stations, complemented by national regional networks consisting of stations intended primarily for surveillance of national and regional seismicity.

- The global network would consist of high quality stations and arrays. Such a network could be modelled by starting with the best stations in operation during GSETT-2, and extending these geographically to give uniform coverage. This network could then be extended or reduced in size to demonstrate several networks of varying sensitivity. Station types might be site-dependent. They should be open stations. Network studies should be based on revised event definition criteria to be proposed by the "Procedures" working group. Standards for station operation should be high.

- For the national regional networks, NDCs should be encouraged to report as accurately as possible on seismic events occurring within their territories. NDCs should be responsive to requests for data from their national networks.

In addition to the items listed above, the Group will endeavour to estimate the detection and identification capability of such global systems (see CCD/PV.713 of 22 July 1976 and CD/PV.48 of 7 August 1979).

12. The Ad Hoc Group established nine working groups of participating experts to elaborate on the following topics relevant to the design of the global system:

- Overall concepts
- Station design
- Site selection
- Network studies
- Seismological procedures
- Establishment of a single International Data Center
- Communications
- Interaction by the IDC with national regional networks
- Cost estimates

13. The Ad Hoc Group noted with appreciation the convening of an informal technical workshop by Australia in Canberra from 27 April to 1 May 1992 to evaluate the results of GSETT-2. Many participants of the Group were able to attend and contribute to the workshop. This aided in the Group's continued work on this subject.

14. The Ad Hoc Group has expressed the view that it might be useful, on a scientific and technical level, to share with the International Atomic Energy Authority (IAEA) the GSE technical concepts for the global exchange of seismic data in order to determine if the IAEA has particular technologies or experiences that might be useful to the Group in its work. To this end, the Ad Hoc Group suggests that, without any financial implications to the Conference, the IAEA be invited to send an observer to attend the Ad Hoc Group's next session.

15. The Ad Hoc Group suggests that its next session, subject to approval by the Conference on Disarmament, should be convened from 15 to 26 February 1993.